Chapter 2

Cabling and Topology

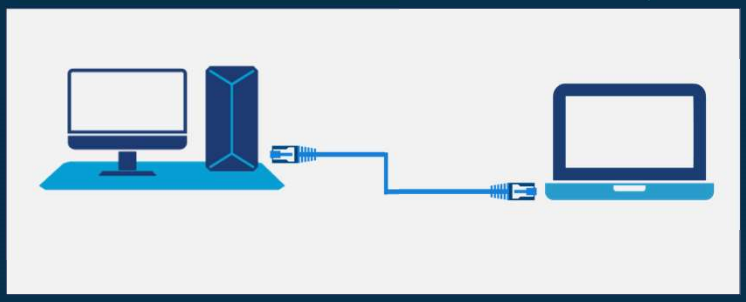
Episode 2.01

Episode title: **Network Topologies, Architectures, and Types**

Objective: **1.6 Compare and contrast network topologies, architectures, and types.**

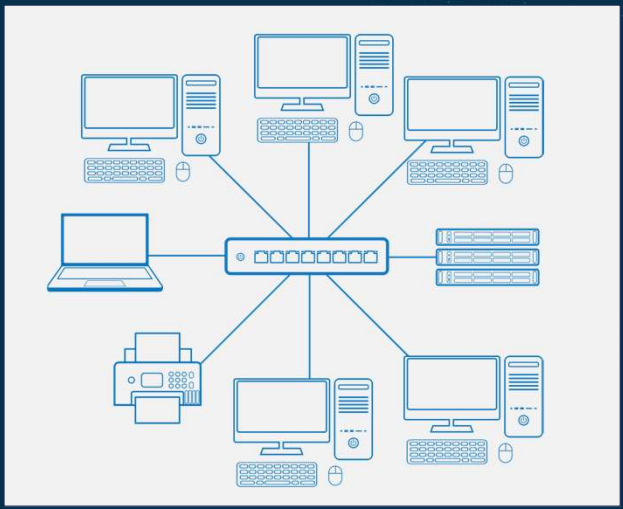
Point-to-Point

Directly connects two network nodes



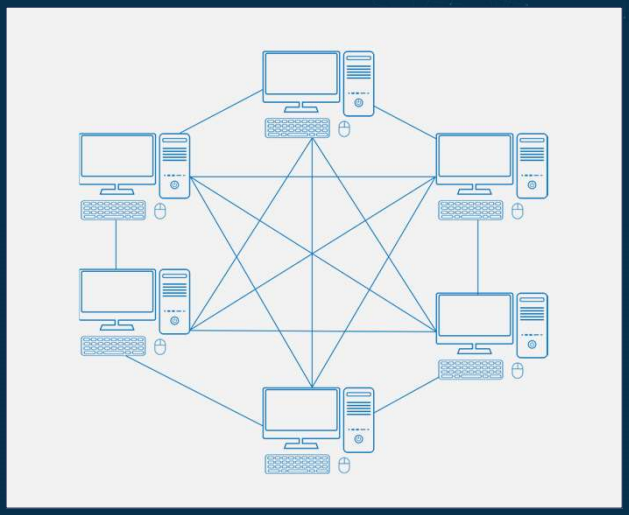
Star (Hub-and-Spoke) Topology

Network nodes connected to central device



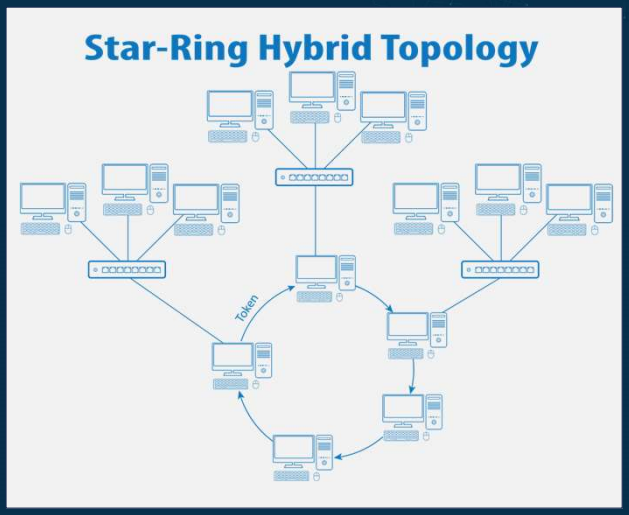
Mesh Topology

Directly connects every device to every other device



Hybrid Topology

Topologies can be mixed depending on an organization's needs

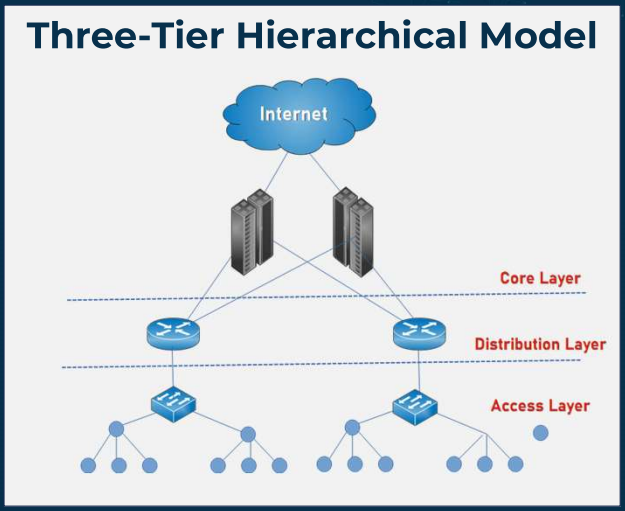


Logical Topologies

Deals with data transmission rather than physical connection

Examples:

- Three-Tier Hierarchical Model
- Collapsed Model



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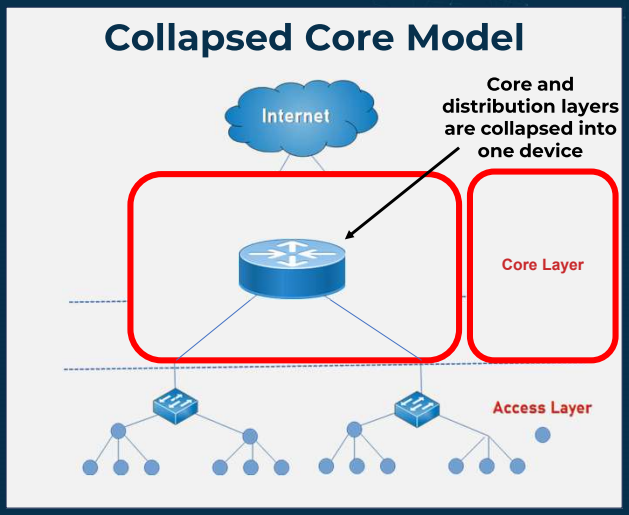
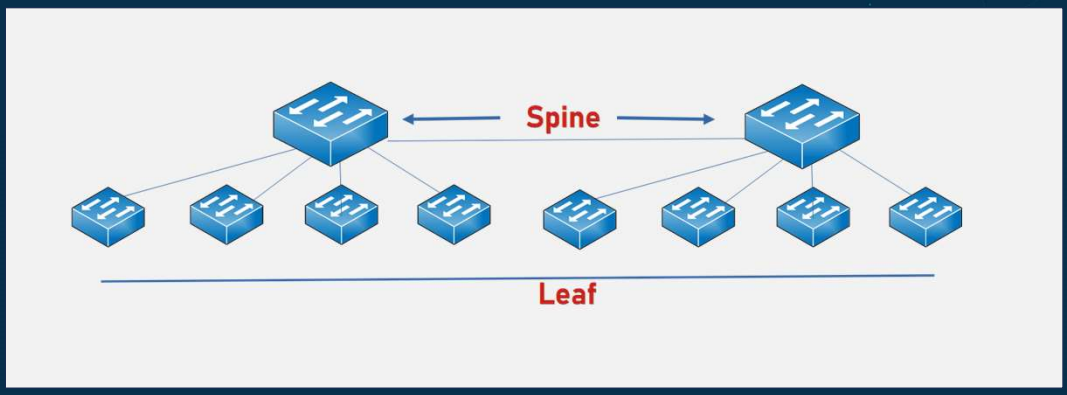


Spine-and-Leaf Topology

Reduces latency and hop counts



Episode 2.02

Episode title: **Coaxial Cabling**

Objective: **1.5 Compare and contrast transmission media and transceivers.**

L3s

Coaxial cable
Inner conductor/core/center wire
Insulator
Outer conductor
PVC sheath/jacket
Radio grade (RG)
Resistance is measured in Ohms (Ω)

L3s

RG-6

RG-6 has a resistance of 75 Ohms

F-type connector

BNC connector

Twinaxial/twinax cable

Two (twin) inner conductors

Coaxial Cable

Advantages

- Highly resistant to electromagnetic interference (EMI)
- Highly resistant to physical damage

Coaxial Cable

Disadvantages

- Inflexible (difficult to install)
- Expensive

Episode 2.03

Episode title: **Twisted Pair Cabling**

Objective: **1.5 Compare and contrast transmission media and transceivers.**

5.2 Given a scenario, troubleshoot common cabling and physical interface issues

L3s

- Twisted cables reduce electromagnetic interference (EMI) and crosstalk
- Unshielded twisted pair (UTP)
- UTP has a maximum distance of 100 meters (325 feet)
- RJ-45 connector
- UTP comes in two standards: TIA/EIA-568A and TIA/EIA-568B

L3s

Solid core

Stranded core

Shielded twisted pair (STP)

UTP Categories

Type	Distance	Max Bandwidth
Cat 5	100 meters	100 Mbps up to 1 Gbps
Cat 5e	100 meters	1 Gbps (better EMI protection)
Cat 6	55 meters	10 Gbps (only up to 55 meters with 10GBASE-T network)
Cat 6a	100 meters	10 Gbps (better EMI and crosstalk protection)
Cat 7	100 meters	10+ Gbps
Cat 8	100 meters	25 Gbps (40 Gbps at 30 meters, 40GBASE-T network)

Episode 2.04

Episode title: **Fiber Optic Cabling**

Objective: **1.5 Compare and contrast transmission media and transceivers.**

5.2 Given a scenario, troubleshoot common cabling and physical interface issues

L3s

Multimode and single-mode
Multimode cables carry LED signals
Single-mode cables carry laser signals
Duplex
ST connector
SC connector
FC connector
LC connector
MT-RJ connector

Episode 2.05

Episode title: **Fire Ratings: Plenum vs. Non-Plenum**

Objective: **1.5 Compare and contrast transmission media and transceivers.**

L3's

Plenum-rated

Riser-rated

PVC or non-plenum rated

Plenum vs. PVC